

Listing of Claims

This listing of claims will replace all previous versions, and listings, of claims in the application.

1. (previously presented) Computer interface system for providing a haptic virtual environment for use in surgical training and/or surgery simulation, comprising:
 - (a) means for providing a cursor with attributes of movement within multiple layers of a graphic display to create or modify one or more virtual objects;
 - (b) means for generating a haptic representation of said one or more virtual objects directly from a graphical representation of said one or more virtual objects, wherein said one or more virtual objects comprise a plurality of layers that are represented by a three-dimensional poly-mesh form;
 - (c) means for creating, modifying, and saving haptic properties of said one or more virtual objects for creating a heuristic database and creating or modifying such a heuristic database; and
 - (d) means for selecting all or a portion of said haptic properties from said heuristic database for the modeling of haptic virtual environments, the system as a whole being constructed and managed so that a user can create said haptic virtual environment without writing any computer code.
2. (previously presented) The system of claim 1, wherein said heuristic database comprises one or more properties of static friction, dynamic friction, stiffness, and damping components.
3. (previously presented) A method of developing and utilizing complex and precise haptic virtual objects for use in surgical training, comprising the steps of:
 - creating a cursor with attributes of movement within multiple layers of a graphic display to create or modify one or more virtual objects;

selecting a virtual object with said cursor;
modifying said virtual object to create a volumetric three-dimensional poly-mesh form that includes a plurality of layers, wherein a computing system converts said virtual object into said poly-mesh form without a user writing any computer code;
modifying a surface stiffness of one or more layers of said poly-mesh form; and
modifying a static and dynamic friction of one or more layers of said poly-mesh form.

4. (previously presented) The method of claim 3, further including the step of touching said virtual object via a haptic device to produce a feeling substantially identical to touching a corresponding tangible object.
5. (previously presented) The method of claim 3, as implemented such that a plurality of properties of said virtual object can be easily modified in order to closely represent human tissue properties.